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ABSTRACT

This investigation examined whether the professional trainers could benefit from a needs analysis course in which real cases from various organizations were used and all the learning activities and materials were geared closely to the learning expectations and preferences of adults. Specifically, this study attempted to find out whether the use of five prominent adult learning preferences could enable the trainers to improve their: posttest achievement; attitudes toward these preferences; and performance in conducting individual needs analysis project. These preferences, which will be detailed in the methodology section, were derived from related literature on adult learning and included well-written, well-organized texts, lectures and handouts, and well-planned class discussions, reflections, and case studies. Research questions of the study included: (1) Were the use of the five adult learning preferences effective in helping the trainers comprehend and recall the needs analysis knowledge and therefore, perform better on the posttest? (2) Were the use of the five adult learning preferences effective in helping the trainers apply the needs analysis knowledge and skills and therefore, be able to implement the individual needs analysis project correctly and effectively? and (3) What were the trainers' attitudes toward each of the learning preferences? Related literature on adult learning characteristics and preferences is reviewed, which serves to provide a theoretical context for the study and to justify the rationale and the significance of the study. Then, the methodology of the study is detailed, and finally, the findings, together with the implications of the findings, are discussed. (Contains 27 references.) (Author/AEF)

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By: Doris Lee

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The Effects of Using Adult Learning Preferences for Trainers

Doris Lee
Penn State Great Valley School

Introduction

This investigation examined whether or not the professional trainers could benefit from a needs analysis course in which real cases from various organizations were used and all the learning activities and materials were geared closely to the learning expectations and preferences of adults. Specifically, this study attempted to find out whether or not the use of five prominent adult learning preferences could enable the trainers to improve their (a) post-test achievement, (b) attitudes toward these preferences, and (c) performance in conducting individual needs analysis project. These preferences, which will be detailed in the methodology section, were derived from related literature on adult learning and included well-written, well-organized texts, lectures and handouts, and well-planned class discussions, reflections, and case studies.

Research questions of the study included: (a) were the use of the five adult learning preferences effective in helping the trainers comprehend and recall the needs analysis knowledge and therefore, perform better on the post-test? (b) were the use of the five adult learning preferences effective in helping the trainers apply the needs analysis knowledge and skills and therefore, be able to implement the individual needs analysis project correctly and effectively? and (c) what were the trainers' attitudes toward each of the learning preferences? In the following sections, related literature on adult learning characteristics and preferences is reviewed, which serves to provide a theoretical context for the study and to justify the rationale and the significance of the study. Then, the methodology of the study is detailed, and finally, the findings of the study, together with the implications of the findings, are discussed.

Adult Learning Characteristics and Preferences

Most literature on adult learning is theoretical, and theorists of adult learning believe that "forms of reasoning, thinking, and judging" of adults are qualitatively different from those characteristics of adolescents and children. This means, unlike adolescents and children, adults have more life experiences and are capable of building up a kind of situational reasoning to interpret their experiences and guide their actions during learning.

In providing a more comprehensive view concerning adult learning, Knowles (1980) pointed out that, adulthood should be defined as, when an individual is essentially responsible for his or her own life and is performing some types of acceptable social roles. Accordingly, adults, while assuming the role of learners, are different from child learners and possess distinct learning characteristics, which are qualities or traits of a person's learning. These distinct learning characteristics of adults include: (a) experience—adults often have rich life experience and are eager to find connections between new information and their experiences; (b) self-direction—adults enjoy directing their own learning and prefer to have freedom to choose their learning experiences based on their interests and/or needs; (c) readiness to learn—adults learn better when they are ready to or need to learn, and anticipate that the learning experience will match their expectations; (d) orientation to learning—adults prefer life-centered or task-centered type of learning versus subject-centered courses and want to apply what they learn in the classroom to real-life situations. Knowles (1984) also believed that adults are more motivated to learn by internal factors, such as increased self-esteem and confidence, than by external rewards like pay raises and job promotions.

In the past two decades, Knowles 's theory has been widely applied by other practitioners to discuss issues related to the learning preferences of adults. Learning preferences refer to the selection or choice of certain learning activities, situations or climates of an adult learner (Loesch & Foley, 1988). For example, Rosemary and Caffarella (1994) elaborated Knowles' theory and explained that adults not only have the need to examine and reflect on their past experiences and prior knowledge, but they can call upon these experiences and knowledge in formulating learning activities and in using them as learning resources. They believed that experiential learning activities, such as reflective journals, critical incidents, and portfolio development could be used to provide opportunities to help adults integrate their past and current experiences into the learning events. Rosemary and Caffarella further pointed out that, additional experiential activities, including field-based learning, small and large group discussion, role play, storytelling, metaphor analysis, case study analysis, and simulation are all effective in encouraging adults to engage in learning and communication with peers.

Other practitioners, including Charlton (1995), Collins (1999), Cross (1981), Dinmore (1997), Ference and Vockell (1994), Johnson (1995), Slusarski (1994), and Zemke and Zemke (1995), all provided suggestions for the use of various adult learning preferences to enhance learning. For instance, while presenting new information to adults, Cross (1981) suggested that: (a) one idea should be presented at a time to avoid overburdening the short-term memory of adults; (b) new information should be presented in an organized way that allows for mastery of the information and for the creation of relations between the new and previously learned information; and (c) frequent review and summarization should be made available to adults for assisting in retention and recall.

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For enhancing abstract conceptualization among adults, Johnson (1995) recommended the use of a well-thought-out, well-presented lecture followed by a focused question and answer section. As for the design of learning situations, Collins (1999) suggested that the provision of structure and direction at the beginning of new activities are helpful to give adults a clear sense of what to expect from the learning journey. Charlton (1995) indicated that offering adults an interactive, performance-centered type of learning environment would be effective in helping adults integrate the new learning with their prior knowledge. Dinmore (1997) also pointed out that interdisciplinary courses that allow for the integration of knowledge derived in formal and informal environments are beneficial to adults. Ference and Vockell (1994) emphasized that adults like to take charge of their learning and are more self-reliant (1994, p. 25). They stated, "adult learners have often acquired their most successful skills through concrete, hands-on experience. They often prefer to continue this practice of learning by doing rather than by listening".

As for increasing adults' learning motivation, Zemke and Zemke (1995) suggested to: (a) make the content appeal to personal growth and gain; (b) describe the immediate and long-term relevance of the content to their lives; (c) stimulate curiosity about the subject matter; (d) ensure low risk for learner; and (e) explore the learners' positive and negative expectations. Finally, to promote adult's self-directing abilities, Slusarski (1994) agreed with other practitioners (Brockett & Hiemstra, 1991; Hiemstra & Sisco, 1990; Knowles, 1980, 1990; O'Donnell & Caffarella, 1990) that learning contracts can be effective in promoting self-direction among adults. Learning contracts that permit learners to " indicate what they will learn, how they will learn it, and how the learning will be evaluated" allow adult learners to plan subsequent learning activities in a more systematic way and therefore, grant them more control over their own learning.

In summary, theorists of adult learning believe that adults have distinct learning characteristics and preferences due to their rich life experiences. Adults learn when they are ready to learn and take pleasure in having self-direction during learning. They tend to build the newly learned information on their past experiences and prior knowledge. They are motivated by being able to see the relevance of the learning content and desire to link the new learning experience with their personal growth and gain. They want to have flexibility in choosing learning activities that are suitable for their learning needs and expectations. Finally, they prefer learning in a progressive manner and favor learning activities that are realistic, well-organized, and interactive.

Method

Research Design and the Participants

This study used the pre-test-post-test research design involving 53 trainers from an instructional analysis course at a north-eastern state university of the US. Among the 53 trainers, 17 were from the section of Fall II, 1998, 21 from Spring I, 1999 and 15 from Spring II, 1999. These trainers were all working full-time in local corporations, businesses, and educational organizations and were all enrolled as part-time graduate students. From the pre-assessment questionnaire, it was revealed that there were 41 females and 12 males with ages ranging from 23 to 50. Most of the participants had at least one to three years of training experience and had taken a course on the use of symptomatic models for training design and development.

Three major steps were included in the study. At the beginning of the class, in each section, the participants were given a pre-assessment questionnaire to gather data on their demographic characteristics, background in training and needs analysis, and their expectations in taking the course. A pre-test was then administered to measure their prior knowledge of needs analysis. After the pre-test, the participants then engaged in learning the knowledge and skills of needs analysis by using the five prominent learning preferences of adults. Throughout the learning process, the participants were expected to apply the content being studied to an individual needs analysis project. Successful completion of the project was required for passing the needs analysis segment. Upon completion of the project, the participants were asked to take the post-test and the attitudinal questionnaire to measure their post-test performance and attitude toward the learning preferences. The participants were not informed about the tests and the attitude questionnaire before taking them.

Learning Content and the Learning Preferences

The learning content included four human performance theories and models and five different data collection and analysis methods for needs analysis purposes. These theories and models included: (a) Allison Rossett's (1987) theory that seeks information to bridge the gap between the optimal and the actual performance, to examine feelings of performers or significant others, to identify causes of problems, and to propose solutions to the problem; (b) Robert Mager and Peter Pipe's (1970) Human Performance Model to examine performance discrepancies, skill deficiencies, and performance punishment issues; (c) Ron Zemke and Thomas Kramlinger's (1982) model to inspect the major human and organizational factors that affect people's performance in an organization; and (d) Thomas Gilber's (1978) theory and formula to calculate the ratio of exemplary performance to typical performance and to determine the potential for improving performance. The data collection and analysis methods included the design and conduction of interviews, focus groups, observations, questionnaires, and critical incident and document reviews.

The five adult learning preferences used were: first, an easy-to-follow textbook geared specifically toward needs and task analysis knowledge and skills, titled, "Figuring Things Out: A Trainer's Guide to Needs and Task Analysis" by Ron Zemke and Thomans Kramlinger (1982). Second, multiple sets of well-organized handouts that corresponded to the text and highlighted critical points of the learning contents. Both the text and handouts provided the participants with an organized means to learn the new and unfamiliar theories and skills of needs analysis. They also set directions for the learning sequences and allowed the participants to conduct frequent previews and reviews of the learning content.

Third, well thought-out and well-paced lectures were used to facilitate participants' conceptual understanding of the aforementioned theories and data collection methods. Also covered by lectures were real examples of needs analysis studies

conducted in various organizations and how the knowledge and skills learned in the course could be applied both personally and professionally. Fourth, following lectures, class discussions were encouraged for the participants to ask pertinent questions, to share ideas with peers, and to stimulate critical reflections on the learning content. During discussions, all the participants were ensured a safe climate in which to exchange constructive information and prior experiences in the areas of training design, and needs analysis.

Fifth, a training performance related case in a business organization was used for the participants to analyze by applying the newly learned theories. The participants in each section were divided into four groups and each group was provided with detailed information about the case. Then, each group was assigned to use one of the four aforementioned theories to analyze the needs of the case. Upon completing the needs analysis for the case, each group had to present the analysis process, the conclusion, and the solutions for the situation. Each group was encouraged to provide reflections on the practice. This practice granted the participants to have an experiential activity that required the application of the newly learned theory to analyze training and performance issues in a real situation. It also permitted the participants to work in a group setting that had a specific goal to reach, was task-based, and needed to be interactive in order to complete the assignment.

More cases were created for the participants to have concrete, hands-on experience to collect, analyze and interpret the meanings of relevant data. Specifically, in this activity, the participants of each section were divided into two groups to analyze if there were performance related gaps or problems in the library and the computer lab of the university that they currently attended. Each group acted as if it were a focus group discussing its experiences in using the services provided by either the library or the computer lab. The discussion evolved around (a) if there was a gap between the service they received and the optimal service they would like to have had; and (b) if there was a gap, what caused it? Based on the results of the discussion, each group then designed a brief observational tool for conducting needs analysis in the library or the computer lab and developed a brief interviewing agenda with which to interview the staff of the library or the computer lab to gather more information. It was suggested that the groups try to create a situation or situations that would allow the group to observe the service provided by the library or the computer lab personnel. Based on the observational tool and interviewing agenda, each group gathered the needs analysis data. Finally, each group had to analyze the data collected from both the observation tool and interview, and recommend a solution based on the findings.

Research Materials

Research materials included a pre-test, a post-test, and an attitudinal questionnaire. All the research materials were developed by the researcher of the study and further reviewed by a colleague of hers, who had a Ph.D. in Instructional Design and Technology and had more than ten years of experience in conducting adult training. The pre-test contained eight open-ended questions, corresponding to the eight learning objectives for the needs analysis section. The wording was changed only slightly to present the objective in question format. Four of the questions covered the four aforementioned theories for needs analysis, and the other four included data collection methods. The post-test was identical to the pre-test except that the questions were presented in a different order.

The attitudinal questionnaire was designed to gather the students' perception of how helpful the used learning preferences were in learning and applying the course content, as well as, how much they enjoyed them. The participants were asked to rank them one through seven, with one being of the least assistance or least liked and seven being of the greatest assistance or the most liked. To avoid bias in the participants' responses and obtain a clearer picture of the participants' attitudes, the questionnaire also included questions on all activities used in the course including the text, lectures, handouts, class discussions and reflections, group-based case studies and presentations, final project, and a combination of all these activities.

In addition, the participants were asked about their perception regarding which activity was most crucial in helping them achieve certain learning outcomes. Specifically, these outcomes were: to recall the learning content, to explain the content to someone else, to analyze the content, to apply the content, to synthesize the content in a meaningful way, and to evaluate the value and usefulness of the content.

Data Collection and Analysis

The pre-and post-tests were scored using a predetermined answer key. A set number of points were assigned to each question based on the scope and difficulty of the question with the total possible points equal to 100. Answers were broken down into sections, and partial credit was given. A paired t-test was performed to determine if the results of the two tests were significantly different from each other.

For the needs analysis project, it is necessary that a needs analysis be based on a real performance or training related issue of an organization. Written guidelines detailing the purpose, procedure and expected outcomes of the final project were made available to the participants prior to the implementation of the project. There were five criteria used to evaluate each project and 20 points were assigned to each criteria. These criteria were: (a) the analyzed situation of an organization was clearly and completely described; (b) an attempt was made to analyze the situation by applying appropriate theory(ies); (c) a hypothesis was formed and effective data collection method(s) was (were) used to test the hypothesis; (d) an objective or scientific reporting of the collected data was included and data was accurately analyzed and interpreted; and (e) effective solutions/recommendations to bridge the performance gap or solve the problem in the situation was proposed.

Two analyses of variance, ANOVA, were first performed for ranking (a) how much the activities helped the participants in learning the content, and (b) how much the participants liked the activities. Once a significant F ratio was revealed by an ANOVA, the Tukey's test, with the total error rate of α=0.05, was performed to determine which ranking means differed significantly from one another. Percentages of responses concerning how the learning preferences helped in reaching each level of learning (recall, comprehension, application, analysis, synthesis, and evaluation) were also calculated.

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Results

The Pre- and Post-tests

A paired t-test was first performed to determine if there was a significant difference between the pre-test and post-test performance. The results revealed that the participants performed significantly better in the post-test than in the pre-test, $t(52)=34.19$, $p<0.0001$. The following Table presents the means, standard deviations, and differences of the t-test results for the pre-and post-tests.

Test	N	Mean	StDev	T	P-Value
Pre-test	53	3.00	6.19		
Post-test	53	79.64	16.58		
Difference	76.64	16.32		34.19	0.0000*

*$p<0.0001$

The Project Performance

All the participants performed very well in conducting the individual needs analysis project (mean=89.972, median=94.00, and St. Dev.=13.42). Table 2 lists the means and standard deviations of the participants' performance in reaching each criteria of the project.

Criteria	Mean*	Median	St. Dev.
Situational Description	18.214	19.000	2.521
Theoretical Analysis	18.337	20.000	2.706
Data Collection	18.393	20.000	3.240
Data Analysis and Interpretations	17.661	20.000	4.231
Recommendation of Solutions	17.321	18.500	17.800
Overall	89.972	94.000	13.42

Discussion

This study revealed a significant performance improvement from the pre-test to the post-test and an outstanding project accomplishment, which lend increasing support to the use of adults' learning preferences. These results suggest that the factors, which impact the professional trainers' learning and the application of the needs analysis knowledge and skills, are mutually dependent. It may be that a good text provided a systematic description of the covered content. Well-organized handouts called the trainers' attention to the most important aspects of the content. Well-thought-out and well-paced lectures further interpreted and analyzed the meaning of the content. Group-based discussion allowed the trainers to share their expertise and related experiences among themselves, and further increased their incentive to learn. Realistic case studies set up scenarios for the trainers to approach and analyze the case and therefore, invoked deeper understanding of all the important factors involved in each case. A combination of these reasons may have accounted for the trainers' success in increasing post-test scores, in doing a great job for the individual needs analysis project, and in developing a more positive attitude toward the combined use of the five learning preferences.

Also, from the results, case studies were perceived by some trainers to be helpful in comprehending and recalling the content. One reason for this may be that case studies demanded the trainers to put the newly learned information into practice and, therefore, empowered them to make a connection between the knowledge and skills gained, and their application. In addition, the project work was cited by most trainers to be effective in helping them apply, synthesize, and evaluate the learning content. It may be that a purposeful, individual project was effective to enhance self-initiation and the self-directing abilities of these trainers. With these abilities, they were able to derive more meaning from the process of accomplishing the project, thereby increasing the ability to apply, synthesize, and evaluate the content. Another reason is that these learning preferences were arranged in a progressive manner. The participating trainers were permitted to build their learning progress hierarchically due to this manner. That is, by the time these trainers were engaged in the project work, they had acquired all the necessary competencies in conducting the needs analysis project. Because of this, they felt more confident in finishing the project and felt that the project work was most beneficial in helping them accomplish most of the learning objectives.

Furthermore, a high level of learning motivation and professional interest held by these trainers may have contributed to their positive learning results. The participating trainers demonstrated their motivation to learn in many ways, such as attending classes regularly, engaging in group discussions, and participating actively in case studies. Most of them expressed

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concerns of conducting needs analysis studies on a trial-and-error basis in the past and were eager to acquire a formal education on the subject. While learning the subject, they truly appreciated the pragmatic nature of the subject, were very enthusiastic about the strong connection from theory to practice provided by the course; and were excited about the possibility of applying the acquired knowledge to their jobs. Therefore, the desire to learn came from within, and such a desire, eventually, made these trainers outperform.

Despite the positive results of the study, there were a couple of limiting factors involved in the study. First, the study did not provide an opportunity for the participating trainers to reveal how, and why, the combined use of the five learning preferences worked for them. For example, in what way did the five learning preferences help them have a successful construction of new concepts about needs analysis? To what extent did the use of realistic, open-ended case studies stimulate these trainers to apply the newly learned knowledge and skills? Second, this study did not investigate the long term effects of these preferences. Questions that need to be answered include: will the positive learning results acquired by these trainers be sustained over a long period of time? Will these trainers continue to achieve successful transfer of the needs analysis knowledge and skills?

Accordingly, for future research, it is necessary to use think-aloud interviews for the participants to discuss, in detail, how and why the use of adult learning preferences assist them to construct, internalize and apply the knowledge and skills of needs analysis. Researchers also need to determine the long term impact of using the preferences of adults to learn subjects with a pragmatic nature. In addition, questions regarding which adult characteristics and/or preferences should be integrated into the learning of different skills including psychomotor, verbal, cognitive, or attitudinal need to be answered. The examination of other factors such as levels of learning motivation, professional interests and needs, and prior knowledge and experiences, which all have impact on adult learning, is necessary.

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